

REMARKS

New claims 11-15 have been added. No new matter was added. Thus, claims 1, 2 and 7-15 are pending in the present application for further prosecution. Applicants submit arguments as to the patentability of the claims over the prior art of record. Accordingly, Applicants respectfully request reconsideration of the rejections and respectfully submit that claims 1, 2 and 7-15 are in condition for allowance.

I. Information Disclosure Statement

In the Office Action dated December 22, 2010, the Examiner returned a Form PTO/SB/08a submitted by Applicants with all references initialed by the Examiner as being entered and considered, except for a pair of foreign references which have lines drawn through them. In the Office Action, it is stated that these two foreign references were not legible and did not contain an English language summary.

Applicants' undersigned Attorney apologizes for any inconvenience; however, the references and corresponding English language Abstracts are perfectly legible as viewed on the USPTO's PAIR system by the undersigned Attorney. Thus, the exact problem with the references being illegible is not necessarily understood by Applicants or the undersigned Attorney. For purposes of entering these two foreign references into the record of the present application, a new Information Disclosure Statement (with an additional Government fee) is being submitted herewith with a full Japanese language copy of each reference and with a full machine English translation of each reference. One of the references discloses copper having 4N purity and the other discloses copper of 6N purity. Applicants' undersigned Attorney respectfully submits that all documents are legible as submitted.

II. Claim Rejection – 35 USC §103(a)

- A. *In the non-final Office Action dated December 22, 2010, claims 1, 2 and 7-10 are rejected under 35 USC §103(a) as being obvious in view of the 1995 publication of Fujiwara et al. titled “Ductility of Ultra High Purity Copper”*

The 1995 Fujiwara et al. publication is directed to a study of the ductility at elevated temperatures of a copper rod of 3N purity as compared to copper rods of 6N and so-called “8N” purity. Only these three copper rod samples (3N, 6N and so-called “8N” samples) are discussed throughout the publication. In addition, the publication identifies sulfur content in the Abstract as follows: “6N and 8N copper have nearly same sulphur content of about 0.015 ppm.” On page C7-296, Fujiwara et al. provide a chemical analysis of the three samples in Table 1 and sulfur is 0.014 ppm for the “6N-Cu” and 0.015 for the so-called “8N-Cu” sample.

As discussed in Applicants’ previous response, Japan Energy Company (which was the name of the Assignee of the present application at the time of publication of Fujiwara et al.) supplied the 6N and so-called “8N” copper rod samples. For example, see the last three lines of page C7-295 and the “Acknowledgement” section on page C7-300 of the publication.

As previously argued by Applicants, it should be clear that the authors of Fujiwara et al. referred to the so-called “8N” sample as being copper of 8N purity; however, this is not accurate. The sample was actually of 7N5 purity at most and the author’s of Fujiwara et al. merely rounded it up to 8N to suit their purposes. This is readily appreciated by careful study of the chemical analysis of the so-called “8N-Cu” sample in Table 1 of the publication.

According to the chemical analysis provided by Table 1 of Fujiwara et al., the total amount of Ag, Al, Si, Ti and Fe as impurities in the so-called “8N” sample is 0.043 ppm (0.0000043%). Thus, the purity of this sample, to be precise, is 99.9999957% (7N5) at most and this assumes all other impurities are zero which is entirely unrealistic. For example, it is

common technical knowledge to one of ordinary skill in the art that the concentration of Cr, Mn and As and like elements as impurities of Cu cannot actually be reduced to zero. Accordingly, the so-called “8N” sample of Fujiwara et al. clearly fails to disclose the purity requirement and residual resistance ratio requirement of the claims of the present application.

For the above reasons, Applicants respectfully submit that it is an error to conclude that the (7N5) or less purity of the sample of Fujiwara et al. is actually 8N and would have the characteristics of a copper sample truly of 8N purity.

Applicants further submit that high purity copper as required by the claims of the present application, for instance, having a total content of impurities, excluding gas components, of less than 0.01ppm is neither disclosed by, nor made obvious to, one of ordinary skill in the art by the Fujiwara et al. publication. Fujiwara et al. simple discloses three specific copper rod samples and compares the ductility of the samples at elevated temperatures.

In addition, the high purity copper required by the claims of the present application does not merely have improved purity in comparison with the three samples disclosed by Fujiwara et al., the claimed invention also yields unexpected results with respect to having an increased residual resistance ratio (which is of no concern with respect to the study of ductility by Fujiwara et al.) and with respect to providing reduced generation of particles of a sputtering target made of the claimed copper (see new claim 15).

Still further claims 9 and 10 of the present application require the copper to have lower amounts of Ag, Al and Fe than the samples disclosed in the Fujiwara et al. publication. Fujiwara et al. provide no disclosure or reason for further limiting content of these specific impurities.

Yet further, Fujiwara et al. expressly state that the samples have 0.015 ppm of sulfur content and that this content does not decrease when the 6N sample is purified to the so-called “8N” sample. This provides a teaching to one of ordinary skill in the art that sulfur can only be

reduced to about 0.015ppm even if the sample is further purified. In contrast, new claim 14 of the present application requires sulfur content to be less than 0.005.

For all the above reasons, Applicants respectfully submit that claims 1, 2 and 7-15 are patentable and not obvious in view of the Fujiwara et al. publication. Accordingly, Applicants respectfully request reconsideration and removal of the rejection of claims 1, 2 and 7-10 as being obvious in view of the Fujiwara et al. publication.

With respect to the amendments made to claim 7, Applicants submit that no new matter was added. For instance, see page 4, lines 1-28, of the present application, as filed. With respect to the subject matter of claims 11, 13 and 14, see page 6, Table 1, and page 7, lines 8-11, of the present application, as filed. With respect to claim 10, see claim 1, as filed. Claim 1 discloses 8N purity and a purity higher than 8N. In new claim 10, this stated purity is simply being narrowed to just include a purity higher than 8N and not 8N purity. Thus, claim 10 merely recites a subset of that which claim 1 requires. With respect to claim 15, see page 8, lines 9-19, of the present application, as filed. No new matter was added.

B. In the non-final Office Action dated December 22, 2010, claims 1, 2, 7 and 8 are rejected under 35 USC §103(a) as being obvious over Fujiwara et al. in view of U.S. Patent No. 4,792,369 issued to Ogata et al.

In the Office Action, it is stated that “Ogata discloses a process of obtaining high purity copper (abstract) where active carbon filtration is used to remove impurities (c4/L1-10).”

Thereafter, the following is reasoned:

“It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the method of purification of Fujiwara by including active carbon purifying means of Ogata because the added active carbon adsorbs and removes impurities present in the solution (c4/L1-10) thus providing product of higher purity.”

Applicants respectfully disagree with this reasoning and respectfully request reconsideration.

While Ogata et al. may teach activated carbon filtering (column 4, lines 1-10), the method of activated carbon filtering disclosed by Ogata et al. and the effects thereof are significantly different from the present invention. Accordingly, even if the activated carbon filter technology of Ogata et al. is applied to Fujiwara et al., it is still not possible to achieve the present invention.

In the present invention, chlorine ions are added to the extracted anolyte and desilvering is performed thereby. Thereafter, activated carbon is additionally added to adsorb impurities including AgCl. The impurities are filtered and eliminated together with the activated carbon (see page 4, lines 13-16, and page 7, lines 1-3, of the present application, as filed.) The Ag concentration of the obtained high purity copper is less than 0.005ppm (see claims 9 and 10 and page 6, Table 1, of the present application, as filed).

However, according to the disclosure of Ogata et al., active carbon filtering (see FIG. 1, reference numeral 8, and column 4, lines 44-48) is performed to the anolyte before being subject to desilvering (see FIG. 1, reference numeral 6, and column 4, lines 61-66) with the stirring cell. Thus, desilvering is performed to the anolyte after the anolyte is first subject to activated carbon treatment. As a result, the Ag concentration of the obtained copper is no lower than 0.3ppm (column 5, lines 12-15). This is due to the method disclosed by Ogata et al. and the arrangement of processing steps, not the amount of active carbon.

Accordingly, the method disclosed by Ogata et al. is clearly and significantly different than that of the present invention and will not be able to produce the same results. Thus, even if the technology of Ogata et al. is used to form the samples of Fujiwara et al., it is not possible or

obvious to achieve the invention claimed by the present application based on Fujiwara et al. in view of the Ogata et al. patent.

For this reason, Applicants respectfully submit that claims 1, 2, 7 and 8 are patentable and not obvious over Fujiwara et al. in view of the Ogata et al. patent. Accordingly, Applicants respectfully request reconsideration and removal of the rejection of claims 1, 2, 7 and 8 as being obvious over Fujiwara et al. in view of the Ogata et al. patent.

C. In the non-final Office Action dated December 22, 2010, claims 9 and 10 are rejected under 35 USC §103(a) as being obvious over Fujiwara et al. in view of U.S. Patent No. 4,792,369 issued to Ogata et al. and in further view of U.S. Patent No. 5,206,430 issued to Itoh et al.

In the Office Action, it is acknowledged that the limitations recited in claims 9 and 10 are not disclosed by Fujiwara et al. or the Ogata et al. patent. However, it is reasoned that Itoh et al. disclose that the amount of active carbon used can be adjusted and that this disclosure makes the claimed invention obvious to one of ordinary skill in the art. Applicants respectfully disagree and request reconsideration.

Itoh et al. discloses means for purifying cinnamic acids via adsorption based on activated carbon (see Abstract of Itoh et al.). Itoh et al. teach that the amount of activated carbon required for purification of this particular material depends on the residual amount of the catalytic component to be adsorbed (see column 3, lines 54-65). The catalytic component disclosed by Itoh et al. is “heavy metal” (see column 1, line 57, to column 2, line 3). According to the Examples disclosed by Itoh et al., the purity of the purified cinnamic acid is 98.8%, and the content of Pa, Cu and Mn is 5ppm or less for all elements. Thus, the purification disclosed by Itoh et al. is completely different from the present invention. Applicants respectfully submit that it would not be obvious for one of ordinary skill in the art to apply any teaching of the unrelated

technology of Itoh et al. (elimination of heavy metals from cinnamic acid) to the present invention.

Further, Itoh et al. clearly fail to overcome the deficiencies discussed above with respect to performing desilvering in the stirring cell (6) of Ogata et al. after active carbon treatment via filter (8) of the Ogata et al. patent.

For these reasons, Applicants respectfully submit that claims 9 and 10 are patentable and not obvious over Fujiwara et al. in view of Ogata et al. and further in view of the Itoh et al. patent. Accordingly, Applicants respectfully request reconsideration and removal of the rejection of claims 9 and 10 as being obvious over Fujiwara et al. in view of Ogata et al. and further in view of the Itoh et al. patent.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that the claim rejections have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment to our deposit account no. 08-3040.

Respectfully submitted,
Howson & Howson LLP
Attorneys for Applicants

By /William Bak/
William Bak
Reg. No. 37,277
501 Office Center Drive
Suite 210
Fort Washington, PA 19034
(215) 540-9216